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ABSTRACT

This paper examines the process of educational achievement for a birth cohort of Baltimore children who were followed prospectively during their first grade year. The analysis, which employed a social-psychological model of the early schooling process, identified some of the personal, interpersonal, and situational factors that influence cognitive development during the period of transition from home child to school child. Gains on standardized tests of verbal and mathematical competence were the achievement criteria used. Black children's lower initial report card marks and slower pace of cognitive growth indicated that they experienced more transition shock making the move into full-time schooling than did white children. The processes that determined the achievement of the two groups were also different. Personality and temperament variables turned out to be very important for early schooling, and evidence was also found for the efficacy of parents as significant others. Self-expectations had effects only on verbal test performance, and there was no indication of peer influence during the settling-in period. Implications of these findings for models of development and for understanding the social psychological basis of achievement are discussed. (Author/RH)

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Report No. 28

July, 1988

A SOCIAL PSYCHOLOGICAL MODEL OF THE SCHOOLING PROCESS OVER FIRST GRADE

Doris R. Entwisle, Karl L. Alexander,
Aaron M. Pallas, and Doris Cadigan

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The Center

The mission of the Center for Research on Elementary and Middle Schools is to produce useful knowledge about how elementary and middle schools can foster growth in students' learning and development, to develop and evaluate practical methods for improving the effectiveness of elementary and middle schools based on existing and new research findings, and to develop and evaluate specific strategies to help schools implement effective research-based school and classroom practices.

The Center conducts its research in three program areas: (1) Elementary Schools; (2) Middle Schools, and (3) School Improvement.

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This program works from a strong existing research base to develop, evaluate, and disseminate effective elementary school and classroom practices; synthesizes current knowledge; and analyzes survey and descriptive data to expand the knowledge base in effective elementary education.

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This program's research links current knowledge about early adolescence as a stage of human development to school organization and classroom policies and practices for effective middle schools. The major task is to establish a research base to identify specific problem areas and promising practices in middle schools that will contribute to effective policy decisions and the development of effective school and classroom practices.

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This program focuses on improving the organizational performance of schools in adopting and adapting innovations and developing school capacity for change.

This report, prepared by the Elementary School Program, examines the effects of background and school factors on the achievement of a cohort of first-grade students as they progress from the beginning to the end of first grade.

A Social Psychological Model of
the Schooling Process over First Grade

ABSTRACT

Children's experiences during first grade, as they pass through a key life-cycle transition, are an especially critical but generally neglected period in the sociology of child development. This paper examines the process of educational achievement for a birth cohort of Baltimore children followed prospectively over their first grade year. Employing a social-psychological model of the early schooling process, the analysis identifies some of the personal, interpersonal and situational factors that influence cognitive development during this period of transition from "home child" to "school child". Gains on standardized tests of verbal and mathematical competence are the achievement criteria used. Black children experienced more transition shock than white children in making the move into full-time schooling, as indicated by their lower initial report card marks and slower pace of cognitive growth during the year. The processes determining the achievement of the two groups also were somewhat different. Personality/temperament variables turned out to be very important for early schooling, and evidence was found as well for the efficacy of parents as "significant others." Self-expectations had effects only on verbal test performance, and there was no indication of peer influence during this important settling in period. Implications of these findings for models of development and for understanding the social psychological basis of the achievement process are discussed.

INTRODUCTION

Age, a prepotent dimension of social organization in all segments of society, is nowhere more prominent than in our school systems. In fact, the recognition of "childhood" as a particular phase of human development coincided with the emergence of universal schooling, and although the boundaries around most life periods are becoming hazy, middle childhood is still clearly the span from age 6, when formal schooling begins, to early adolescence, when children move from elementary to middle or junior high school. Somehow, though, despite middle childhood's distinctiveness as a life period and despite the increasing research attention devoted to the transition that marks its end (see the research summaries reported in Collins, 1984), the transition at its beginning has been neglected. This paper begins to fill part of that gap.

Transitions are times when people's social roles are redefined by some non-familial authority (Elder, 1968), times when new social expectations and obligations are assumed. Research to date on life transitions underlines the wisdom of thinking about transitions in terms of social constructs. For example, Simmons and her co-workers (Simmons and Blyth, 1987; Rosenberg and Simmons, 1972) demonstrate that moving from elementary to junior high increases stress of the adolescent transition partly because students move from being "top" to "bottom" dog in the school social system. In fact, this change in relative social standing appears to be more critical in terms of possible damage to the student's self-image than is the timing of puberty. In similar vein, the physical changes of puberty affect the adolescent transition mainly by way of the social constructions people put on those changes. Girls find this transition difficult in part because the

physical changes that accompany pubescence involve increasing body fat, and "fatness" in contemporary American society is undesirable.

The transition that occurs when children begin formal schooling marks another time when youngsters experience a sharp drop in social standing. They go from the protective circle of the family where they are rated in ipsative terms — how they compare with themselves last month or last year — to the intensely competitive arena of the classroom where they are rated almost daily relative to 25 or 30 other children. At the same time they face a number of challenging psychic tasks. They must construct an image of self as student, discover the norms and mores of the school, learn how to get along with new peers and authority figures, and map strategies for mastering the necessary skills.

The immediate social context obviously is critical for children as they engage in these developmental tasks. For example, parents give explicit advice on how to "get along" best in school, but perhaps even more important parents convey their attitudes and expectations about the school and about schooling through many subtle expressions and actions. They can portray school as a hostile or hospitable place merely by a glance or a chuckle. And classmates react to students in ways that are unambiguous and direct.

A Meadian perspective in particular suggests that first-grade children evaluate themselves and construct expectations for their school performance on the basis of evaluations of significant others. We suspect that parent influence is likely to outweigh that of peers when children are beginning school because of the psychological closeness of parent and child at this point in life. Additionally children may respond quite differently to school according to their family's socioeconomic level because parents of

different socioeconomic levels socialize their preschool children differently in preparing them to enter school (Hess et al., 1968). For example, parents of higher socioeconomic status portray school as a place responsive to individual needs and effort whereas parents of lower status emphasize the need of the child to conform and respect authority.

The child's more distal social context should also be influential over this transition because children, even at this age, recognize the major fault lines in society. They are well aware, for instance, of the existence of ethnic and minority groups and have particularly clear conceptions of some of the implications of gender. Primary school children know about jobs in terms of their sex-typicality (Swafford, 1975), for instance, and about the "gender-appropriateness" of various school subjects (Entwisle et al., 1987). There is little doubt that the social psychological climate of school does differ for children of the two sexes (Entwisle and Baker, 1983). It also differs for those from various socioeconomic and ethnic backgrounds, even in first grade. Alexander, Entwisle, and Thompson (1987) found, for example, that the social distance in terms of social class background separating children from teachers has a direct bearing on teachers' expectations for children's performance and also on how teachers judge children's personal maturity. Clearly, then, both proximal and distal aspects of social structure would be expected to impinge on the first-grade transition.

As implied above, transitions are informative in terms of understanding life change because they are points of maximum continuity/discontinuity in development of social roles. But transitions also are strategic periods for study because they provide a particularly

clear window on social-psychological development — during such periods variability among individuals tends to increase. This latter reason for studying transitions is not widely appreciated. Rather like what happens in a bicycle race, it is hard to make distinctions among people when all are clustered together pedalling along on the straightaway but a hill spreads people out so it is easier to see who is leading and who is falling behind. Life transitions are crucible periods when people are challenged and differences among them tend to widen.

In this paper we will track a birth cohort of Baltimore youngsters as they make the transition into full-time schooling.[1] We will focus especially on how the children's significant others and they themselves help or hinder the settling-in process. We will also consider how the larger social structure impinges on cognitive growth by investigating how children's minority status and socioeconomic background affect school performance during this period.

THE MODEL

The vehicle for this inquiry will be a multivariate school process model akin to those applied extensively at the secondary level in so-called "status attainment" research. As in that tradition, the model organizes some of the structural, interpersonal, and intrapersonal forces that direct individuals' achievement strivings.

The first, and still most elegant, integration of these themes is the Wisconsin "school process" model (see Sewell, Haller and Portes, 1969; Sewell, Haller, and Ohlendorf, 1970; Haller and Woelfel, 1972), which gives primacy to the individual as goal-oriented actor, and seeks to explicate the interpersonal and situational processes that explain individual differences

in achievement orientations. The Wisconsin model, though, affords only a snapshot of experiences during secondary school and very little is known about the developmental precursors of the socio-psychological processes involved at that level. In fact, with the exception of Entwisle and Hayduk's studies (1978; 1981; 1982), research at the primary level has not attempted a broadly inclusive accounting of the social-psychological processes that underlie achievement processes. Since the aim here is to look specifically at children's cognitive growth over first grade in terms of the social and interpersonal forces that govern it, the Entwisle-Hayduk (1982) model will be elaborated. In particular, information about the child's temperament/personality and special problems (vision, hearing) will be included. Personality variables are not customarily included in studies of achievement at the secondary level because, although significant statistically, they have turned out to be of quite small magnitude (see Gottfredson, 1982; Muese 1979). At the primary level, however, children's temperament, ability to concentrate and social maturity could turn out to be much more important.

Figure 1 about here

The child's ascriptive characteristics -- race and sex -- appear first in the model for obvious reasons. Because we wish to measure gains in achievement, initial CAT scores in the verbal and math areas are in the first block as well. Personality or temperamental characteristics associated with developmental maturity of the child are included in the first block because, as mentioned, for children beginning school

developmental maturity may be especially important. Teacher and peers may rate more positively those children who get along well in a group and who are usually happy, and give such children more learning opportunities. By the same token, youngsters who are restless, disruptive, and unable to concentrate would be expected to profit less from instruction.[2]

Family effects of two kinds appear in the model. Parents' educational background is a well-known source of variance in status attainment at the secondary level, and the available evidence, although scarce, points to strong effects of parents' educational background at the primary level as well (see Heyns, 1978; Weikart et al., 1978). Parents are also implicated in the model as significant others. By their daily interactions with the child they help shape the child's early self-concept and achievement. In this model three variables capture the influence of parents as significant others: parents' notions of the child's ability level relative to other children in the school, and parents' specific expectations for how well their children will perform in the key areas of reading and mathematics.[3]

Particularly important for children of this age is an indicator taking account of special problems (vision, hearing, and the like) that could impair progress in first grade. Because we view this as a control variable, it appears in a separate block below the initial block in Figure 1.

The importance of informal relations among pupils, particularly peer-popularity, for school performance is captured in the second block of Figure 1. Inclusion of peers in the model rests mainly on theoretical grounds that support the existence of relationships between peer-popularity and pupil attitudes and achievement (Coopersmith, 1959; Horowitz, 1962). Recent studies by Ladd and Price (1987) suggest that the social dimension of peer

relations is especially salient during the early elementary years, while other research on elementary-school children shows that low peer-popularity leads to low utilization of academic abilities (Echelberger, 1959; Schmuck, 1962, 1963).

The child's self-expectations appear in the model both as outcomes and as antecedents. These are located in the first and third blocks of the model, corresponding, respectively, to fall and spring self-assessments. Children develop expectations for their own performance based on how others react to them, and take this information into account when they evaluate their own performance. Entwisle and Hayduk (1982) and Brookover and colleagues (1967, p.77) both provide evidence for a link between self-concept of ability and school achievement.

The child's performance is periodically assessed by teachers' marks, and these too appear in the model as intervening variables. First quarter marks are located in the second block, third quarter marks in the third block. This allows us to consider how performance evaluations from early in the year might differ from those later in the year. Since we are especially interested in first grade as a transition period, the signals provided by marks are of particular interest. For youngsters the social situation should be most fluid at this point, and these marks constitute their first formal evaluation from adult authority in the school context. We assume that all actors use such feedback to regulate their behavior, and it is through such mechanisms that marking distinctions impact upon subsequent learning and self views.

Our model also considers attendance (Wiley and Harnischfeger, 1974).

It may be especially important for school beginners because early reading and mathematical instruction is hierarchically arranged.

Variables in the model are added in successive blocks that reflect the presumed sequencing of their impact. In most instances the timing of measurement conforms to this sequence (see the description of the study design below). One exception is the measure of developmental maturity, which was secured late in the year but appears in the initial block. Another exception is the indicator for problem referral, which pertains to referrals throughout the year. Many of these problems, though, like vision problems, were "pre-existing," but only would be identified or recognized as difficulties presented themselves during the school year.

The model traces the flow of influence through the annual schooling cycle. The first block of variables includes individual and background factors (sex, race, various parent influences, the child's own expectations and personal maturity) that are present either before schooling begins or very early in the school year (in the case of the pupil's own performance expectations).[4] The second block of variables implicates school experiences early in the school year: the first mark, popularity with peers, and regularity of attendance. The third block incorporates school experiences later in the year: the child's expectation for end of year performance and third quarter (spring) mark in the relevant academic domain.[5]

Verbal and quantitative standardized test performance at the end of grade one are considered separately as outcomes. Both scores at the beginning of the year are inserted as part of the first block. (The pattern of findings is the same whether one test score or both are inserted in the initial block.) The influences of predetermined variables are

constrained to be domain specific: for verbal outcomes, the relevant explanatory variables pertain to reading (parent's expectations for reading performance, child's expectations for reading performance, and reading marks); for math outcomes, the relevant explanatory variables pertain to math (parent's expectations for math performance, child's expectation for math performance, and math marks). The model is estimated by full information maximum likelihood procedures. Reliability estimates are provided in Table 1.

METHODS

The Sample

The data come from the Beginning School Study (BSS), initiated in the fall of 1982 in 20 Baltimore City elementary schools. A stratified random sampling was employed to assure a sample about equally divided by race and representative of all socioeconomic levels in the school system. In order to begin obtaining parental consent before the start of school in the fall, kindergarten rosters from 1981-82 served as initial sampling lists. These were supplemented by rosters of first grade classes in the fall. Both rosters were used to draw random samples of children from each first grade classroom in the 20 schools in September 1982. Less than 3% of the children thus selected were excluded because of parent refusals. By this means 825 Baltimore City first graders were selected into the study. For purposes of this analysis a birth cohort was identified by selecting only children who were 6.9 years or less in December of 1982.

Beginning in the summer and continuing into the fall, 785 parents (usually the mother) were interviewed. Pupils were interviewed individually on two occasions, before the issuance of first quarter report cards in the

fall and again between the third quarter and year-end report cards. Teachers were asked to respond to three questionnaires, staggered throughout the year. Of fifty-five first grade teachers, 51 provided at least some data.

Analyses to be presented here are based on a "core sample" of 676 children, those who were not repeating first grade, who remained in the study for the entire year, and whose parents and teachers provided data through interviews and self-administered questionnaires, respectively. Missing values were imputed for about 15% of the values for the personal maturity and peer popularity variables, 2% of the values for the four variables involving parents, and a maximum of 1% of the values for other variables, using separate means for those who were promoted or not promoted at the end of the year.[6]

Procedure

Data were collected directly from parents, students and teachers on separate occasions. Parents were questioned in their homes in late summer or early fall. Children were interviewed individually during school hours in the fall but later than parents. All fall interviews were completed before the end of the first marking period. Measurement of parents' and children's expectations thus preceded issuance of the children's first report cards. In late March, after children had a chance to get to know each other, teachers rated students in terms of peer popularity. Teachers also answered 14 questions pertaining to each student's personal maturity in the spring. Between the third and fourth (final) marking periods a second student interview was conducted, which is the source of the data on children's expectations for their end-of-year marks. Marks, absences, problem referral

records, and CAT scores were obtained from school records after the end of the academic year.

Variables

Race. Race was coded 0 for white, 1 for black. The few (7) orientals and Indians in the sample were coded (0).

Sex. Sex was coded 0 for boys, 1 for girls.

Parent's educational attainment. This information, obtained directly from parent interviews, indicates the number of school years completed.

Parent's ability estimate. Parents were asked: "How do you think your child compares with other children in his/her school in terms of ability to do school work?" scored from (5) Among the best to (1) Among the poorest.

Parent's expectations. Parents provided their "best guesses" for their child's first mark in reading and mathematics: 4 for Excellent, 3 for Good, 2 for Satisfactory and 1 for Unsatisfactory. These distinctions correspond to the marking system used on report cards.

Personal maturity. This indicator is the sum of 14 items taken from the 1976 version of the National Survey of Children.[7] Using a grid labelled "exactly like," "very much like," "pretty much like," "somewhat like", "a little like," "not at all like," teachers rated each student on 14 items. Values ranged from 1 to 6, with items reflected as necessary so that high values would correspond to positive assessments.

1. Very enthusiastic, interested in a lot of different things, likes to express his/her ideas.
2. Fights too much; teases, picks on or bullies other children.
3. Can't concentrate, can't pay attention for long.
4. Usually in a happy mood; very cheerful.

5. Rather high strung, tense, and nervous.
6. Is not liked much by other children.
7. Cheats; tells lies; is deceitful.
8. Shows creativity or originality in school work.
9. Acts too young for his/her age, cries a lot or has tantrums.
10. Has a very strong temper; loses it easily.
11. Is awfully restless, fidgets all the time, can't sit still.
12. Keeps to himself/herself; tends to withdraw.
13. Very timid, afraid of new things or new situations.
14. Is polite, helpful, considerate of others.

The alpha reliability of the scale for this sample is 0.873, and is reduced less than .02 when any item is deleted. Factor analyses indicated that a single factor dominated the response pattern, and that this factor structure held for separate analyses by sex and race.[8]

Problem referral status. This dichotomous measure indicates whether the child had any non-routine test or service during first grade. Any referral causes a value "1" to be assigned, otherwise "0".

(1) to the school promotion committee (all decisions not to promote are reviewed by such a committee);

(2) to the school screening committee (referrals to the promotion committee are scrutinized first by this committee);

(3) to the committee on adjustment (this committee reviews children who are class behavior problems);

(4) for psychological services including individual testing;

(5) to the speech therapist;

(6) for social worker visit to the child's home;

(7) to the reading resource specialist;

(8) to the vision or hearing specialist;

(9) to the physical therapist;

(10) to the attendance worker.

Children's Expectations. Before children received their first report card, in individual interviews they guessed their forthcoming marks in reading and mathematics by "playing a game". (See Entwisle and Hayduk (1982) for a description of this procedure.) Children's expectations for mathematics and reading were coded from 4 (high or "E"-excellent) to 1 (low or "U"-unsatisfactory). Just before the year-end report card, children were reinterviewed and asked to make guesses concerning the marks they expected to receive on their last report card.

Marks. Marks in reading and mathematics were obtained from school records. These are: E (Excellent), G (Good), S (Satisfactory), or U (Unsatisfactory), coded from "4" to "1" respectively.

Peer popularity. Ratings, obtained from teachers in the spring, are coded from "5" (most popular) to "1" (least popular).

Absences. Absences for the school year were taken from school records.

CAT scores. In October 1982 and May 1983, system-wide testing provided California Achievement Test scores (Level 11 Form C). The verbal CAT score used here is the average of 4 subtests (phonic analysis, vocabulary, comprehension and language). The math CAT score used here is the average of 2 subtests (computation and concepts). If one or more subtests was missing, the "average" is the average of the available subtests.

Technical documentation (CAT Technical Bulletin 1, 1979) indicates the test has good psychometric properties even with group administration with beginning first-graders. The test-retest correlation is reported as .83 over a 2-week interval.

RESULTS

Table 1 presents means and standard deviations for all variables for the total sample and also by separate race subgroups.

Parent's educational attainment averages just under high school graduate overall, and is slightly higher for blacks than for whites. Parents' expectations (for the fall only) and children's expectations have similar means across the race groups, with the children's averages being consistently higher than the parents'. For children's marks, there is a small but consistent margin favoring whites: first quarter marks in reading and math are 0.2 to 0.3 points higher for whites; third quarter marks in reading and math are about 0.3 points higher. These differences correspond to about a third of a pooled standard deviation in each instance (see the deltas in the fourth column of Table 1). The marks are in the C range on average, and for the most part low C's, far below the expectations held by either parent or pupils.

Table 1 about here

Children's average expectations at the start of grade one are above B in both reading and math. Despite receiving marks considerably lower than they expected in the fall, by spring children did not lower their

expectations. In fact, the average level for children's expectations in the spring is slightly higher than it was in the fall.

Children's average personal maturity as rated by teachers is approximately equivalent for the two races. There are a few more white children referred for problems than black children, but not significantly more. In general, differences in the independent variables across race groups measured at the start of grade one are small. This holds as well for the verbal and mathematics CAT scores obtained shortly after these children started first grade. Test score averages are quite close for blacks and whites. The range for verbal and math scores is 2 to 6 points, which is small relative to the total variation in the tests (the fall test standard deviations are in the 20-35 point range).

This near parity of fall test scores is noteworthy, since it suggests that the characteristic pattern of white test score advantage emerges over the course of schooling. To the extent that this anticipated racial disparity derives from differences in early school experience, our framework may shed some light on its origins. Our regression results are therefore presented for the black and white subsamples separately, as well as for the full sample.

Inspection of the spring test scores indicates that the racial spread has indeed increased some over first grade. Average gains from fall to spring for the entire sample are quite substantial: close to two standard deviations for both the verbal CAT (55.32) and the math CAT (44.50). Whites, though, have gained a few more points in both domains than have blacks.

Parameters estimated to explain these gains in CAT verbal and math scores for the sample as a whole appear in Table 2 and separately for the two races in Tables 3 and 4. (Our consideration of race comparisons will be highly selective because we are interested mainly in describing the general achievement process.) Metric coefficients are given first for each variable, with the corresponding standardized effects in parentheses below.

The model includes fall CAT scores in the initial block, so the focus is on gains in each CAT domain over the year. In strictly empirical terms, this framework proves quite powerful, accounting for almost 80% of the variance in spring verbal CAT scores and over 75% of the variance in math. Background and student characteristics alone, including student's personal maturity and problem referrals, account for a large fraction of the variance in each domain (74% and 73%, respectively).

Tables 2, 3, and 4 here

Parameter Estimates

In most respects results for verbal and quantitative performance are quite similar, and so they will be discussed together.

Year-end test performance is substantially determined by factors already "in place" at the time of school entry, with fall test scores having large effects. Such continuity in performance levels at the onset of formal schooling highlights both the importance of preschool development in structuring cognitive capacities and the constraints under which schools labor. Nevertheless, the results indicate that other factors can, and do, influence the course of cognitive development.

The fact that fall testing levels are controlled throughout has important implications for the interpretation of the coefficients. By adjusting for initial test differences, the design isolates sources of change in cognitive performance over the period of observation. Hence, the other significant coefficients in these equations may be understood as contributing specifically to cognitive growth during first grade.

Another way of thinking about these results involves comparisons across (rather than within) persons. The fall test controls adjust statistically for individual differences in testing levels at the time of school entry. The effects of other variables thus can be viewed alternatively as contributing to cognitive differences at year's end among youngsters who began the year with equivalent scores. Whether it is the sources of cognitive growth over the first grade or the sources of individual differences in cognitive competencies that is of most interest, this sort of design provides a powerful interpretive framework (Coleman, 1982).

The coefficients for personal maturity are especially large. In the verbal area this effect almost equals that for entry-level test scores. The large personal maturity effects indicate that individual differences of disposition or of temperament play an important role in early achievement. Youngsters who do the sorts of things that are expected of them make markedly greater progress than youngsters for whom the requirements of the student role do not come quite so "naturally." Importantly, the superior performance of these youngsters is not just in the eyes of the teacher, who might be expected to evaluate more favorably pupils who cause the fewest problems. Rather, the criterion here is performance on a standardized achievement battery, which is a relatively impartial barometer of cognitive

level. Moreover, the intervening variables added in the second and third steps of the analysis, which include both first and third quarter marks, reduce these temperament effects only by about a third. It thus appears that youngsters of a certain disposition profit much more from instruction in first grade than do others. And since school achievement patterns tend to be highly stable over time, there is little doubt that these early cognitive advances will pay substantial returns later on.

Other significant effects from the first block of predictors are much smaller, but interesting nonetheless. There are significant negative total race effects in both domains, with that in the math domain remaining significant throughout. This effect tends to diminish over the year for the verbal CAT suggesting that school experience serves to reduce (or account for) differences across racial groups.

Sex differences appear only in math. Among whites, boys' test scores tend to improve more than girls' over first grade (girls are scored "1" and boys "0" on this measure). Among blacks, though, girls outpace boys, but not significantly. (The significance of these race/sex interactions is evaluated in the last columns of the pooled analyses in Table 2, which adds a race/sex product term to the main effects analysis.) The math interaction, but not the reading, is significant.

The gap in cognitive scores by minority/majority status widens a bit over the course of first grade, due in part to race differences in patterns of growth among boys and girls. The slower pace of growth among blacks is small when compared against the overall upward trend — being on the order of 8 to 10 points, relative to aggregate increases of about 55 points in the

verbal domain and 44 points in the quantitative -- but even this small shortfall is disturbing.

Parents are implicated in these early achievement processes mainly as significant others. With fall test scores controlled, parents' education has a small negative effect on spring performance.[9] Parents' ability judgments have no significant effects. However, parents' expectations for their children's performance in specific subject areas (e.g., reading and math) are important sources of influence on year-end test scores in reading. This evidence of parental influence is impressive because these effects are estimated net of differences in fall test scores and also with personal maturity, race and the other controls in place.[10] We should note too that parent expectations were procured before the issuance of first report cards in the fall, and in many instances even before school began in September. Hence, parents' expectations were framed, in the main, independent of information on their child's school performance or adjustment difficulties. In contrast to this evidence of parent influence, the pupil's own expectations in the fall have only a small negative bearing on verbal achievement, and no significant effect on math.

The second and third blocks add small but significant increments in explanatory power, and these are proportionately larger among blacks than among whites (compare R-Squared statistics in the bottom rows of Tables 3a and 3b). There are rather large effects for first and fourth quarter marks. Of course, marks and test performance are grounded in similar competencies, but marks have the additional property of constituting feedback from teachers to both students and their parents. The fact that mark effects generally are larger among blacks than whites (see Tables 3a and 3b) may

reflect precisely their importance as sources of reinforcement, as we have no reason to expect that teacher's marks will be more sensitive to differences of ability and effort among blacks than whites. On the other hand, there are slight (and nonsignificant) differences in parent expectation effects in reading that favor whites. It is possible that minority youngsters more so than whites look to their teachers for feedback and encouragement, while whites rely more on their parents as agents of academic socialization. In empirical terms, these differences appear to account for the differences in explanatory power noted above.

Also suggestive are the effects observed for the youth's spring expectations, apparent in the verbal area. This effect is not large, but it hints at an increase in personal efficacy as these youngsters mature and become more experienced in the ways of school.

DISCUSSION

Three general conclusions stand out. First, the transition into full-time schooling differs in important ways for black and white children: although they begin with substantially equivalent levels of competence, they do not register the same amounts of growth over the year. Second, the personal maturity variable, which is affective in nature, has large effects on children's growth in both domains. Third, parents stand out as important sources of interpersonal influence during this period when children begin formal schooling. Parent expectations for performance are an important force in early verbal achievement while peer popularity is not.

The ease with which children make the transition into first grade, here indexed by growth in achievement scores, depends on their ascriptive

characteristics. Growth over first grade in math is greater for white boys. Most discussions of differential math achievement by sex focus on the period of adolescence (e.g., Parsons, et al., 1982) and there is a tendency to assume that children of the two sexes perform at the same level in math over elementary school. The data here, though, indicate a small developmental advantage of boys over girls as early as the first grade.

"Transition shock" for blacks as a group occurs in both domains. And despite the smaller amounts of growth registered by black children, school factors appear to play a greater role in their cognitive gains. The variables in the second and third blocks of the model add little explanatory power for whites' math gains -- the explained variance for them increases only by 1.5% when these two blocks are added to the model. But adding these two blocks to the model increases the explained variance for blacks over twice as much (3.7%). For verbal gains the difference is even greater: for whites it is 4.1%, and for blacks about 1.5 times that - 6.6%. Hence, events in the first year of school are apparently more important for the achievement gains of black children than they are for those of white children. Or conversely, home and background factors are relatively more important for the achievement gains of white children. This accords with the conclusion from other studies that the role of schools in fostering cognitive growth is more important for blacks than it is for whites (Coleman, et al., 1966; Heyns, 1978).

Despite close equivalence in personal and familial resources at the start, blacks did not gain as much as whites over the transition period. One clear stumbling block is marks -- black children receive lower marks than whites all along, starting with the first mark, even though their test

scores, personal maturity and other characteristics would predict otherwise (see Entwisle and Alexander, in press). All the reasons for this are yet to be discovered but one is that teachers from higher status backgrounds judge low status or minority children to be less mature and hold lower expectations for them than do teachers from lower status backgrounds (Alexander, Entwisle, and Thompson, 1987). This puts an extra burden on black children. Parent variables and youth's own performance expectations appear not to play much of a role in producing this racial gap, although parent expectation effects are somewhat higher for whites. This pattern emergent racial disparities should encourage further consideration of h classroom organization (e.g., Leiter and Brown, 1985; Rowan and Miracle, 1983) and classroom process (e.g., Barr and Dreeben, 1983; Alexander, Entwisle, and Thompson, 1987) might fit into the picture. It is likely that a satisfactory accounting of achievement processes in the primary grades eventually will have to combine elements from both the "socialization" and the "allocation" perspectives, much as studies at the secondary level have begun to do (see Kerckhoff, 1976, concerning such an integrated approach).

Affective Factors

The personal maturity variable, which proved to have large effects for these children's attainment in both the verbal and math domains, strongly affects the ease with which children make this transition. It is not easy to conceptualize but it includes attributes like restlessness, timidity, and being prone to fight, which measure affective development on dimensions appropriate for children just starting school. Children who have the ability to postpone gratification, to be socially responsive in appropriate

ways, to maintain control over their emotions, to be in a positive frame of mind, apparently profit more from early schooling.

In fact, the linkage between socioemotional status and school performance may be one route by which children most directly affect the course of their own development. A life course approach emphasizes that individuals in many ways prompt their own development. For example, children who do their homework likely contribute to their own cognitive growth. But at a deeper level, children's ascriptive characteristics, such as minority status as discussed above, and other personal characteristics can be important. Dispositions and temperament probably affect teachers and other students in subtle ways that also can speed or slow development (see Thomas and Chess, 1981, pp. 247-252). A child who has attained a "suitable" level of socioemotional maturity is positioned to benefit from the opportunities for growth offered in first grade. The strong effects of personality constructs observed for these first graders support Lerner's (1985) ideas regarding the importance of temperament as an explanatory variable in development, and especially the importance of what he terms "goodness of fit" between aspects of temperament and demands or presses of the social context.

Most discussions of how noncognitive traits of this sort fit into the social organization of schooling are short-sighted from a developmental perspective, no doubt because of researchers' inattention to the achievement process in the early school years. Our results may offer an important corrective to such thinking.

At higher grade levels, "temperament" does not stand out as prominently as it does for first graders. We believe this is precisely because the

influence of affective development on cognitive development expresses itself from the very beginning, and is absorbed early into youngsters' achievement trajectories. Since aspects of temperament may be more stable than other kinds of psychosocial development (McCall, 1986; Thomas and Chess, 1986), as time passes the direct influence of affective traits on cognitive outcomes will cycle down. Quite simply, the strength of this effect in the early years is translated into achievement levels that then persist. Thus, by high school, affective or temperament factors will have smaller direct effects than we observe at the elementary level, which is what secondary school research indicates. This does not mean, though, that temperament variables are unimportant; rather their maximum influence occurs earlier and is carried along via stability in children's achievement trajectories, school records and learning styles.

In complementary fashion, we expect that other affective-type variables — plans, goals, aspirations and expectations — will gain salience with time as youngsters acquire a more definite sense of personal efficacy (or inefficacy) and become more cognizant of long-term goals. Here, we see that effects of first grade pupils' own performance expectations, while significant in the verbal area in the combined sample and for blacks in the separate analysis, are weak. Their expectations are taking form but not very stable in first grade (Alexander & Entwisle, in press). In prior research children's expectations did not affect first grade marks but did affect marks by third grade (Entwisle and Hayduk, 1982, p.101). Eventually, then, the academic self-image will likely displace temperament as an immediate factor in school achievement processes. The effects of the latter are carried along in the continuity of achievement

patterns, while the former won't exercise much influence until later, when "expectations" become absorbed into the sense of self and begin to give direction to energies. Precisely when this crossover occurs may, in fact, be a pivotal developmental turning point. Some youngsters, for example, may pass this developmental milestone before others, and so they may realize a decided advantage in subsequent academic competitions — for preferred track placements, in extracurricular involvements, and so on.

Thus, the social psychological factors involved in achievement processes appear to differ considerably depending on which particular stage of schooling or which particular aspect of personal development is at issue. This insight, in turn, underscores the importance of both a long time frame and a conceptual apparatus that takes an explicit developmental perspective for understanding the complex interplay between cognitive and affective development.

Other Implications

While hesitant to press conclusions based on any one study too far, we believe the present effort has some distinct strengths. The potential of a life course perspective, when joined with a research design that tracks a birth cohort over the period of a critical transition, for informing understanding of the early schooling process is impressive. Most importantly it reveals that the two racial groups, which were equivalent in many key respects (schools attended, parents' educational level, initial achievement status) at the start of first grade, were not equivalent at the end. Our panel design and beginning and end of year testing data thus afford a rare opportunity to observe the emergence of ascriptively linked cognitive differences in a group of young children. And the first grade may

be a particularly critical period in children's academic development, as social role transitions can be especially stressful (Hultsch and Plemons, 1979; Rutter, 1983).

An important consideration in interpreting our findings is the key nature of the home-to-school transition. If one group of children makes this transition differently from another, or more productively than another, the long-term consequences may be substantial even if the differences at the end of one year are only a few CAT score points. The black children can be seen as making the home-to-school transition somewhat differently than the white children, because school influences affected the achievement levels of blacks more than the same influences affected the achievement of whites. The home and background influences of whites remained strong enough, especially for males, to lead to a substantial advantage for them at the end of the year in math. And what starts out here as small differences can potentially be compounded many times over, as this early disparity no doubt is one contributor of the black-white gap in school achievement documented in numerous studies at higher grade levels.

FOOTNOTES

1. For studying transitions this is an important distinction. Most studies of schooling focus on samples defined by grade level where students include repeaters as well as those who are going through a grade for the first time.

2. Although data on the relation between personality factors and young children's school performance are scarce, there is some indication that performance responds to personality rather than the reverse. In a longitudinal study that identified children with behavior problems at age 3, reading retardation in problem children was observed at age 8. But children without behavior problems at age 3 who developed reading retardation at age 8 did not then develop behavior problems (Richman, Stevenson and Graham, 1982).

3. In earlier exploratory research on another large sample of Baltimore children, a long list of parent variables was winnowed down to the four variables employed here. See Entwisle and Hayduk, 1982.

4. As noted, the problem referral indicator is placed in a separate block here to indicate that it is not thought of as an exogenous variable in the same sense as other variables in the first block.

5. The child's mark in conduct is included at this point as a predictor of gains in verbal or math achievement because for young children deportment can be an important determinant of learning (Entwisle and Hayduk, 1982).

6. Values of variables are very close whether or not imputations are used. For example, the mean for personal maturity with imputations is 68.00 and the mean without imputations is 67.99. Zero-order correlations were calculated for all pairs of variables, and these differ only in the third decimal place.

7. There is no information in the open literature on the psychometric properties of this scale but it was given to teachers in Wave One (1976-77) of the National Survey of Children sponsored by the Foundation for Child Development. Information reported here was provided by Zill (Nicholas Zill, personal communication, October 9, 1987).

The scale is based on the research of Kellam et al. (1975), of Rutter, Tizard, and their colleagues (1970, 1973, 1976), and Cycle II of the National Health Examination Survey (NCHS, 1971). Items were chosen that seemed, on the basis of prior research, to discriminate between children who needed psychological help or special educational resources and those who did not, and/or to represent some of the more common behavior problems that had been described by Kellam, Rutter, and others. These patterns included an aggressive-deceitful syndrome, a distractible-overreactive syndrome, and a withdrawn-timid syndrome. For balance, 4 items that tapped positive adjustment were also included.

8. In the National Survey of Children all items loaded on a major first factor and thus could be considered as tapping a common underlying dimension. Zill reports internal consistency reliability of .90 for the full scale. Our findings with the BSS concerning the psychometric properties of the scale are very similar to Zill's. We use it here

primarily as an overall indicator of personal maturity that could affect the first grade transition. We believe it characterizes reasonably well individual differences in behavioral or response tendencies important in children of this age group, but we are agnostic as to whether these are most properly construed as facets of personality or of temperament (see McCall, 1986, on the blurring of the boundaries between these constructs).

9. Parents' education correlates .34 with the fall verbal subtest and .33 with the quantitative. Hence, the small negative direct effect on spring performance should not be misconstrued as indicating a true negative socioeconomic influence on early cognitive development.

10. The coefficient for the problem referral variable also is significant in both instances, indicating that those youngsters with physical impairments or behavioral problems that complicate adjustment to the schooling routine suffer cognitively as a result.

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Table 1. Means for first grade school process variables--
Total sample, and separately by race

	Total (N=676)	White (N=302)	Black (N=374)	Delta	Reliability (square root of proportion of true variance in indicator)
Fall verbal test score	278.723 (31.196)	279.592	278.021	.05	.83[a]
Fall math test score	269.767 (25.537)	273.205	266.991	.24	.83[a]
Sex (Female=1)	.503 (.500)	.503	.503	.00	1.00
Race (Black=1)	.553 (.498)	-----	-----	---	1.00
Personal maturity score	68.972 (10.361)	69.796	68.307	.14	.87[b]
Parent's education (years)	11.931 (2.484)	11.677	12.137	-.18	.84[c]
Parent's ability estimate	3.657 (.836)	3.531	3.758	-.27	.90[d]
Parent's fall reading expectation	2.701 (.736)	2.650	2.741	-.12	.90[d]
Parent's fall math expectation	2.725 (.686)	2.717	2.732	-.02	.90[d]
Child's fall reading expectation	3.217 (.829)	3.223	3.212	.01	.70[d]
Child's fall math expectation	3.303 (.790)	3.331	3.281	.06	.70[d]
School problem referral (Yes=1)	.219 (.414)	.238	.203	.08	.70[f]
First quarter reading mark	1.879 (.701)	2.017	1.768	.36	.90[d]
First quarter math mark	2.236 (.842)	2.422	2.087	.40	.90[d]
Peer popularity (teacher report)	3.545 (1.065)	3.567	3.527	.04	.90[e]
Absenteeism (in days)	13.205 (11.571)	12.735	13.584	-.07	.95[d]
Child's spring reading expectation	3.311 (.790)	3.408	3.232	.22	.80[d]
Child's spring math expectation	3.368 (.801)	3.360	3.374	-.02	.80[d]
Third quarter reading mark	2.265 (.892)	2.426	2.135	.33	.90[d]
Third quarter math mark	2.506 (.920)	2.685	2.362	.35	.90[d]
Third quarter conduct mark	1.783 (.413)	1.848	1.730	.28	.90[d]
Spring verbal test score	334.044 (35.959)	338.444	330.490	.22	.85[a]
Spring math test score	314.271 (31.148)	320.519	309.226	.36	.85[a]

Note: Delta = white mean minus black mean divided by pooled standard deviation. Standard deviations in parentheses.

[a] CAT test manual

[b] Cronbach α for this population

[c] Test-retest over one year interval (Alexander & Entwisle, in press)

[d] See Appendix B, Entwisle & Hayduk (1982)

[e] Assumed to be of same quality as report card grades

[f] The completeness of these records varies greatly from school to school, especially in first grade. However, since information is pooled (any problem out of 10 possible leads to a value of unity being assigned), our conservative guess is that about 50% of the true variance is being recorded.

Table 2. Parameter estimates for model predicting verbal and math test performance in spring of first grade

	Spring Verbal Test				Spring Math Test			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Fall Verbal Test	.324*	.304*	.249*	.250*	-.090*	-.098*	-.117*	-.114*
	(.278)	(.261)	(.214)	(.214)	(-.089)	(-.097)	(-.116)	(-.113)
Fall Math Test	.364*	.328*	.263*	.263*	.772*	.762*	.719*	.718*
	(.256)	(.230)	(.184)	(.185)	(.626)	(.617)	(.582)	(.581)
Sex (Female=1)	1.196	1.828	2.294	1.427	-2.214	-2.200	-1.481	-6.347*
	(.018)	(.018)	(.035)	(.022)	(-.039)	(-.038)	(-.026)	(-.111)
Race (Black=1)	-4.616*	-3.421*	-1.453	-2.233	-6.087*	-5.352*	-4.993*	-9.346*
	(-.069)	(-.051)	(-.022)	(-.034)	(-.105)	(-.093)	(-.087)	(-.162)
Personal Maturity	1.017*	.903*	.639*	.640*	.705*	.669*	.608*	.607*
	(.296)	(.263)	(.186)	(.187)	(.237)	(.225)	(.205)	(.204)
Parent's Educ.	-.663*	-.965*	-1.033*	-1.036*	-.670*	-.692*	-.579	-.607*
	(-.045)	(-.066)	(-.071)	(-.071)	(-.053)	(-.055)	(-.046)	(-.048)
P-Child's Abil.	.655	.806	.594	.570	.803	.755	.990	.793
	(.016)	(.019)	(.014)	(.014)	(.022)	(.021)	(.027)	(.022)
P-Fall Expect.	7.007*	6.189*	4.200*	4.206*	2.954*	2.408	1.777	1.986
	(.148)	(.131)	(.088)	(.089)	(.059)	(.048)	(.035)	(.040)
C-Fall Expect.	-1.222	-1.494	-1.516*	-1.900*	-1.180	-1.169	-.942	-.946
	(-.026)	(-.031)	(-.040)	(-.040)	(-.027)	(-.027)	(-.022)	(-.022)
Problem Referral	-12.898*	-11.766*	-7.598*	-7.575*	-14.900*	-13.870*	-10.583*	-10.379*
	(-.135)	(-.123)	(-.079)	(-.079)	(-.180)	(-.167)	(-.128)	(-.125)
First Quarter Mark		5.045*	-4.998*	-4.898*		2.514*	-4.447*	-4.156*
		(.101)	(-.100)	(-.098)		(.070)	(-.124)	(-.116)
Peer Popularity		.259	.124	.183		-.107	-.717	-.377
		(.008)	(.004)	(.006)		(-.004)	(-.025)	(-.013)
Absenteeism		-.179*	-.171*	-.170*		.042	.040	.042
		(-.059)	(-.058)	(-.058)		(.017)	(.016)	(.017)
C-Spring Expect.			2.772*	2.771*			.368	.414
			(.059)	(.059)			(.009)	(.010)
Third Quarter Mark			16.457*	16.558*			10.242*	9.960*
			(.420)	(.417)			(.311)	(.303)
Conduct Mark			-2.750	-2.796			-1.940	-2.182
			(-.032)	(-.033)			(-.026)	(-.030)
Race X Sex				1.557				8.751*
				(.021)				(.137)
R^2	.740	.749	.795	.795	.726	.729	.746	.752

*coefficient is greater than or equal to twice its standard error

Note: Standardized coefficients in parentheses

Table 3a. Parameter estimates for model predicting verbal test performance in spring of first grade

	White			Black		
	(1)	(2)	(3)	(1)	(2)	(3)
Fall Verbal Test	.330*	.331*	.251*	.357*	.316*	.293*
	(.308)	(.309)	(.235)	(.282)	(.250)	(.232)
Fall Math Test	.206*	.194*	.175*	.465*	.395*	.320*
	(.152)	(.144)	(.130)	(.308)	(.262)	(.212)
Sex (Female=1)	-1.185	-1.124	.330	3.302	4.260*	3.603*
	(-.017)	(-.016)	(.005)	(.052)	(.067)	(.056)
Personal Maturity	.928*	.861*	.392*	1.054*	.865*	.711*
	(.261)	(.242)	(.110)	(.319)	(.262)	(.215)
Parent's Educ.	-.804	-1.175*	-1.283*	-.174	-.448	-.665
	(-.059)	(-.086)	(-.094)	(-.011)	(-.029)	(-.043)
P-Child's Abil.	1.362	1.230	1.987	-.164	.074	-.556
	(.031)	(.028)	(.045)	(-.004)	(.002)	(-.014)
P-Fall Expect.	10.768*	10.410*	7.128*	4.937*	3.310*	2.152*
	(.234)	(.226)	(.155)	(.102)	(.068)	(.044)
C-Fall Expect.	1.354	1.179	.895	-2.774*	-2.834*	-2.900*
	(.027)	(.024)	(.018)	(-.061)	(-.062)	(-.064)
Problem Referral	-15.445*	-13.609*	-12.996*	-10.969*	-10.333*	-4.834*
	(-.161)	(-.142)	(-.136)	(-.115)	(-.109)	(-.051)
First Quarter Mark		3.028	-5.239*		6.509*	-5.484*
		(.055)	(-.095)		(.139)	(-.117)
Peer Popularity		.581	.491		1.034	.597
		(.018)	(.015)		(.031)	(.018)
Absenteeism		-.213	-.177		-.114	-.121
		(-.059)	(-.049)		(-.045)	(-.047)
C-Spring Expect.			2.265			3.440*
			(.046)			(.076)
Third Quarter Mark			14.489*			17.419*
			(.360)			(.448)
Conduct Mark			5.251			-5.829*
			(.052)			(-.077)
R^2	.767	.773	.808	.726	.737	.792

*coefficient is greater than or equal to twice its standard error

Note: Standardized coefficients in parentheses

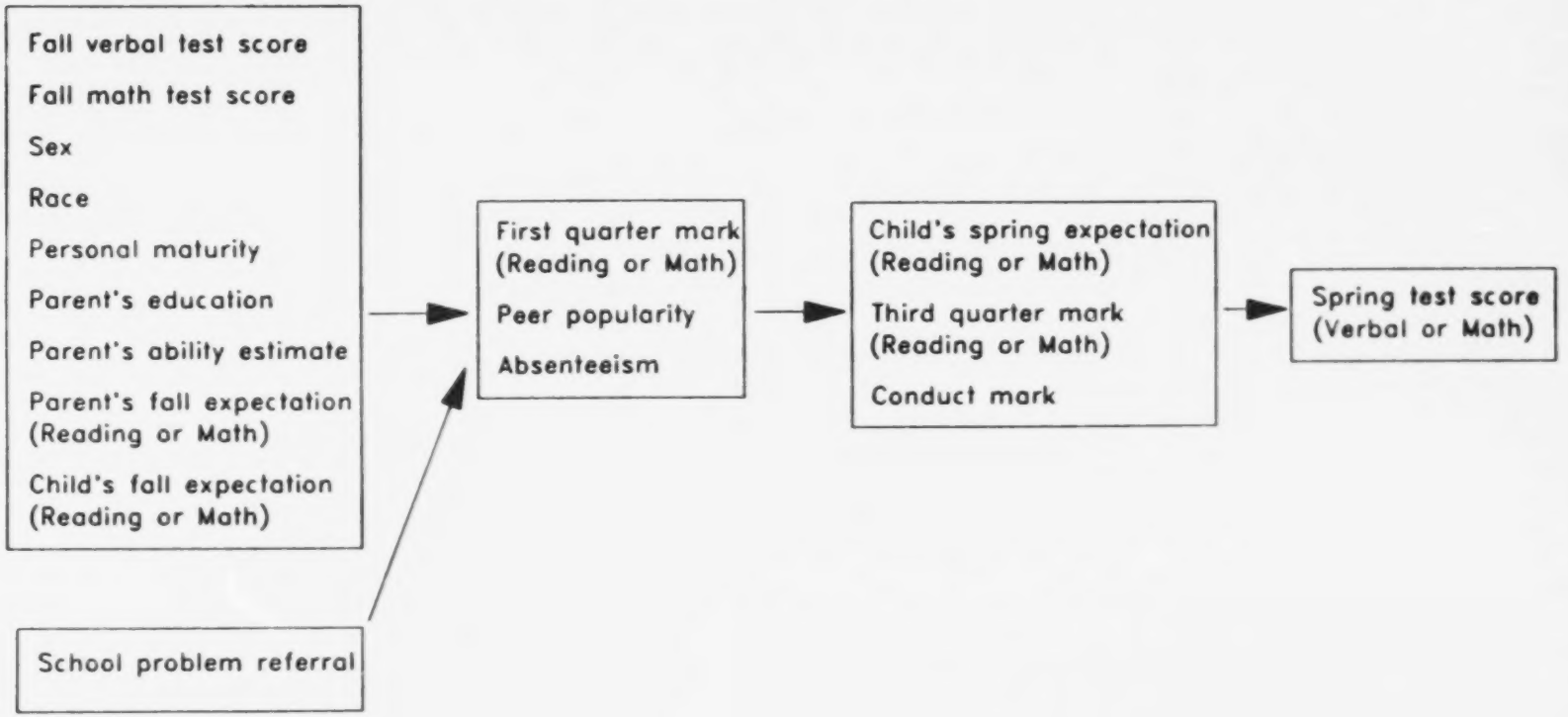
Table 3b. Parameter estimates for modal predicting math test performance in spring of first grade

	White			Black		
	(1)	(2)	(3)	(1)	(2)	(3)
Fall Verbal Test	-.275*	-.276*	-.293*	.029	.016	.015
	(-.314)	(-.315)	(-.335)	(.025)	(.014)	(.014)
Fall Math Test	.996*	.997*	.954*	.739*	.726*	.674*
	(.904)	(.904)	(.868)	(.548)	(.538)	(.500)
Sex (Female=1)	-3.751*	-3.780*	-3.311	.846	.749	1.744
	(-.067)	(-.068)	(-.059)	(.015)	(.013)	(.031)
Personal Maturity	.012	.015	-.140	1.065*	1.024*	.994*
	(.004)	(.005)	(-.048)	(.361)	(.347)	(.337)
Parent's Educ.	-1.496*	-1.476*	-1.428*	-.226	-.152	-.008
	(-.135)	(-.133)	(-.129)	(-.016)	(-.011)	(-.001)
P-Child's Abil.	3.500*	3.490*	3.718*	-.322	-.540	-.337
	(.096)	(.096)	(.102)	(-.009)	(-.019)	(-.009)
P-Fall Expect.	1.443	1.484	.756	2.264	1.933	1.966
	(.036)	(.037)	(.019)	(.048)	(.041)	(.042)
C-Fall Expect.	-1.011	-1.040	-1.063	-1.728	-1.338	-1.468
	(-.023)	(-.023)	(-.024)	(-.042)	(-.044)	(-.035)
Problem Referral	-26.418*	-26.566*	-25.575*	-8.364*	-6.693*	-.741
	(-.338)	(-.340)	(-.327)	(-.099)	(-.079)	(-.009)
First Quarter Mark		-.177	-5.206*		2.931*	-7.455*
		(-.005)	(-.145)		(.081)	(-.206)
Peer Popularity		.030	-.488		.324	-.387
		(.001)	(-.019)		(.011)	(-.013)
Absenteeism		.014	-.001		.153*	.176*
		(.005)	(.000)		(.067)	(.077)
C-Spring Expect.			1.158			-.821
			(.029)			(-.021)
Third Quarter Mark			7.728*			14.689*
			(.244)			(.434)
Conduct Mark			3.210			-5.230*
			(.039)			(-.077)
R^2	.763	.763	.778	.740	.746	.777

*Coefficient is greater than or equal to twice its standard error

Note: Standardized coefficients in parentheses

Figure 1. A Social-Psychological Model of the First Grade Achievement Process[a]



[a] The model is fully recursive, with influence flowing from left to right between blocks. "Lagged" arrows are omitted for convenience of presentation.